



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/063,808	05/15/2002	Ramgopal Darolia	13DV-13711	4319

30952 7590 07/10/2003

HARTMAN AND HARTMAN, P.C.  
552 EAST 700 NORTH  
VAIPARAISO, IN 46383

EXAMINER
----------

VERSTEEG, STEVEN H

ART UNIT	PAPER NUMBER
----------	--------------

1753

DATE MAILED: 07/10/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/063,808

Applicant(s)

DAROLIA ET AL.

Examiner

Steven H VerSteeg

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-13, 15-20, 22-30 and 32-34 is/are rejected.
- 7) ☒ Claim(s) 4, 14, 21 and 31 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 May 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Art Unit: 1753

## DETAILED ACTION

### *Oath/Declaration*

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the city and either state or foreign country of residence of each inventor. The residence information may be provided on either on an application data sheet or supplemental oath or declaration.

### *Specification*

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The abstract of the disclosure is objected to because the abstract is greater than 150 words long. Correction is required. See MPEP § 608.01(b).

### *Drawings*

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: **18** (Figure 1). A proposed drawing correction, corrected drawings, or amendment to the specification to add the

Art Unit: 1753

reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

*Irradiated Mail*

5. The papers filed on April 24, 2002 (certificate of mailing dated April 24, 2002) have not been made part of the permanent records of the United States Patent and Trademark Office (Office) for this application (37 CFR 1.52(a)) because of damage from the United States Postal Service irradiation process. The above-identified papers, however, were not so damaged as to preclude the USPTO from making a legible copy of such papers. Therefore, the Office has made a copy of these papers, substituted them for the originals in the file, and stamped that copy:

COPY OF PAPERS  
ORIGINALLY FILED

---

6. If applicant wants to review the accuracy of the Office's copy of such papers, applicant may either inspect the application (37 CFR 1.14(d)) or may request a copy of the Office's records of such papers (*i.e.*, a copy of the copy made by the Office) from the Office of Public Records for the fee specified in 37 CFR 1.19(b)(4). Please do **not** call the Technology Center's Customer Service Center to inquiry about the completeness or accuracy of Office's copy of the above-identified papers, as the Technology Center's Customer Service Center will **not** be able to provide this service.

7. If applicant does not consider the Office's copy of such papers to be accurate, applicant must provide a copy of the above-identified papers (except for any U.S. or foreign patent documents submitted with the above-identified papers) with a statement that such copy is a complete and accurate copy of the originally submitted documents. If applicant provides such a

Art Unit: 1753

copy of the above-identified papers and statement within **THREE MONTHS** of the mail date of this Office action, the Office will add the original mailroom date and use the copy provided by applicant as the permanent Office record of the above-identified papers in place of the copy made by the Office. Otherwise, the Office's copy will be used as the permanent Office record of the above-identified papers (*i.e.*, the Office will use the copy of the above-identified papers made by the Office for examination and all other purposes). This three-month period is not extendable.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-3, 5, 6, 8-13, 15, 16, 18-20, 22, 23, 25-30, 32, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,174,571 B1 to Corderman et al. (Corderman) in view of US 6,042,898 to Burns et al. (Burns).

10. For claim 1, Applicant requires a PVD apparatus comprising a coating chamber, means for providing at least two passages through which at least two materials are fed into the coating chamber with at least one of the materials having a composition with a higher vapor pressure than a second of the materials, means for melting the first and second materials and operable for melting at different rates, means for suspending an article relative to the melting pools so as to deposit a coating on the article with a controlled composition that is a mixture of the first and second materials.

Art Unit: 1753

11. Corderman discloses a PVD apparatus (Figure 3) comprising a chamber **110**, means for providing at least two passages to replenish materials for a crucible for coating onto a substrate (col. 3, l. 47-57), means for melting the materials **150**, and means for suspending the substrate and moving it (Figure 3). Corderman is forming a barrier layer (col. 1, l. 8-10) for a turbine blade (col. 3, l. 46-47).

12. Corderman does not disclose that the electron beams melt the first and second materials at different rates, but when the materials are different, they will melt at a different rate.

13. Burns discloses that when making a Turbine blade, one of the compositions typically used is MCrAlY alloy (abstract) as a thermal barrier coating. The coating is typically deposited by electron beam evaporation (col. 1, l. 24-56).

14. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the composition taught by Burns to form a barrier coating on the turbine blade because MCrAlY is a typical coating conventionally used as barrier material for turbine blades.

15. For claims 2 and 19, Applicant requires a crucible in which the two passages are defined. Corderman discloses the use of crucibles **120** to which the passages are fed.

16. For claims 3 and 20, Applicant requires the melting means to be electron beams. Corderman uses electron beams as the melting means (col. 3, l. 58-61).

17. For claims 5, 15, 22, and 32, Applicant requires a first beam for the first crucible and a second beam for the second crucible. Corderman uses a separate beam for each crucible (Figure 3).

Art Unit: 1753

18. For claims 6, 16, 23, and 33, Applicant requires the materials to be in the form of ingots. Corderman feeds ingots to the crucibles (col. 3, l. 47-57).

19. For claims 8 and 25, Applicant requires the first material to be beta NiAl. For claims 9 and 26, Applicant requires the addition of chromium. For claims 10 and 27, Applicant requires the first material to comprise chromium. Corderman uses beta NiAl as the first material and also uses chromium (Example 2).

20. For claims 11, 12, 28, and 29, Applicant requires the second material to be zirconium, hafnium, yttrium, or cerium. When Burns modifies Corderman, there is yttrium present.

21. For claim 13, Applicant requires an electron beam PVD apparatus comprising a coating chamber, a crucible with at least two passages through which at least two materials are fed into the chamber with the first being an ingot of beta-NiAl containing chromium and the second comprising yttrium such that the first material has a higher vapor pressure than the second material; means for generating at least one electron beam for melting the materials to form molten pools with the means being able to melt the materials at different rates; and means for suspending and article for coating relative to the melting pools.

22. As noted above, Corderman discloses all of the limitations except for using yttrium, but modification with Burns obviates claim 13.

23. For claim 18, Applicant requires a PVD process comprising providing at least two passages through which at least two materials are fed into a coating chamber of a PVD apparatus with the first material having a higher vapor pressure than a second of the materials; melting the materials to form molten pools at different rates; and suspending an article within the chamber and transporting the article relative to the two molten pools to deposit a coating on the article.

Art Unit: 1753

24. Using the method of Corderman when modified with the composition of Burns results in the limitation of claim 18 being met. Specifically, Corderman has the two crucibles with two passages in the chamber, melting means, and a moving substrate that is suspended above the crucibles. Corderman does not disclose the materials to have different vapor pressures. As noted above, modification with Burns is obvious and provides the limitation. Also, Corderman discloses a process of using the apparatus (abstract).

25. For claim 30, Applicant requires an electron beam physical vapor deposition process comprising the steps of providing a crucible having at least two passages through which at least two materials are fed into a coating chamber, a first of the materials being an ingot of beta-NiAl containing chromium, a second of the materials comprising yttrium such that the first materials has a higher vapor pressure; generating at least one electron beam to melt the materials and form molten pools with the melting being at different rates; and suspending an article in the chamber and transporting the article relative to the pools to deposit material on the article.

26. Using the method of Corderman when modified with the composition of Burns results in the limitation of claim 30 being met. Specifically, Corderman has the two crucibles with two passages in the chamber, melting means, and a moving substrate that is suspended above the crucibles. Corderman does not disclose the materials to have different vapor pressures. As noted above, modification with Burns is obvious and provides the limitation. Also, Corderman discloses a process of using the apparatus (abstract).

27. Claims 7, 17, 24, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,174,571 B1 to Corderman et al. (Corderman) in view of US 6,042,898 to Burns et al.



Art Unit: 1753

(Burns) as applied to claims 1, 13, 18, and 30 above, and further in view of US 5,296,274 to Movchan et al. (Movchan).

28. For claims 7, 17, 24, and 34, Applicant requires the replenishment of the second materials to be by using a wire.

29. Corderman in view of Burns is described above but does not describe replenishing the second material by using a wire. Corderman is open to any method of replenishment of feeding the material through the passageways.

30. Movchan discloses that one method of replenishing a crucible in electron beam PVD deposition is to feed a wire of the material into the crucible (Figure 4).

31. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Corderman in view of Burns to use wire to replenish the second material because Corderman is open to any means for replenishment and Movchan discloses that a common manner for replenishment is to use a wire.

***Allowable Subject Matter***

32. Claims 4, 14, 21, and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

33. The following is a statement of reasons for the indication of allowable subject matter: it is neither anticipated nor obvious over the prior art of record to have an apparatus as claimed by Applicant in claims 4 and 14 or a process as claimed by Applicant in claims 21 and 31 wherein there is only one electron beam that sequentially is projected as each of the first materials.

• Art Unit: 1753

34. Corderman in view of Burns and further in view of Movchan is described above. Neither reference individually uses a single electron beams to process the multiple material sources.

Modifying any of the references to provide such a limitation would require hindsight.

### ***General Information***

For general status inquiries on applications not having received a first action on the merits, please contact the Technology Center 1700 receptionist at (703) 308-0661.

For inquiries involving Recovery of lost papers & cases, sending out missing papers, resetting shortened statutory periods, or for restarting the shortened statutory period for response, please contact Palestine Jenkins at (703) 308-3521.

For general inquiries such as fees, hours of operation, and employee location, please contact the Technology Center 1700 receptionist at (703) 308-0661.

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H VerSteeg whose telephone number is (703) 305-4473.

The examiner can normally be reached on Mon - Thurs (7:30 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Art Unit: 1753

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Steven H VerSteeg  
Primary Examiner  
Art Unit 1753

shv  
July 8, 2003